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SOIL AND AGRICULTURE

3.c Principles of sustainable
and smart agriculture
Romania-3.1



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Introduction

Sustainable agriculture can be viewed as ecosystem operation of complex relations among soil, water, creatures, climate, and people. The thing is to integrate all these factors into a product system that's applicable for the terrain, the people, and the profitable conditions where the ranch is located.

Farms come and stay environmentally sustainable by imitating natural systems, creating a ranch geography that mimics as nearly as possible the complexity of healthy ecosystems. Nature tends to serve in cycles, so that waste from one process or system becomes input for another.

Sustainable agriculture is meant to shield the environment, maintain soil fertility, and even expand the natural resource base of the world. The three main goals of sustainable agriculture are: economic profitability for farmers, the promotion of environmental stewardship and a rise in welfare for farmers, their communities and their animals while producing enough to fulfill the wants of humans.



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Three key goals are incorporated into the work of sustainable agriculture practitioners: a healthy environment, financial success, and social and economic equality.

A sustainable agricultural system may be ensured by all participants in the food system, including farmers, food processors, distributors, retailers, consumers, and waste managers.

<https://pixabay.com/photos/sheep-lamb-pasture-wool-cattle-6639023/>

Problem's description

People who work in sustainable agriculture and sustainable food systems employ a variety of approaches. Growers can employ techniques to improve soil health, use less water, and reduce farm pollution.

Customers and merchants who are concerned about sustainability might search for “values-based” goods that are produced in a way that supports the welfare of farmworkers, is environmentally benign, or boosts the local economy.

According to the soil's intended use, the definition of a healthy soil will change, but they frequently include elements of each of the following functions: productivity/yield, nutrient cycling, holding water for plant uptake, filtering contaminants, withstanding erosion, and mitigating crop diseases.

Following crop uptake, microorganisms that create N_2O can use any nitrogen that is still present in the soil. Therefore, limiting the application of nitrogen fertilizer can aid in reducing the emission of this greenhouse gas.

There are greenhouse gas emissions connected to each step of the food system, including production, processing, distribution, retail, preparation, and waste management. A cradle-to-grave assessment of the advantages and impacts all along the food supply chain is necessary to develop a sustainable food system.



The functioning of agroecosystems has been cut off from the internal cycling of important plant nutrients like nitrogen and phosphorus due to a significant reliance on chemical fertilizers.

Although phosphate minerals are now mined for fertilizer, it is anticipated that the world's supplies would only last for another 50 to 100 years.

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As a result, phosphate prices are predicted to increase unless new reserves are found and improvements in phosphate recovery from waste are developed. Utilizing organic nutrient sources, recycling nitrogen and phosphorus (at the farm and regional levels) and increasing the effectiveness of fertilizer applications. Water for agriculture is in short supply or is getting worse in many places of the world. Overdraft of groundwater supplies jeopardizes future irrigation capacity, while overdraft of surface waters disturbs important riparian zones.



Water quality problems such as salinization, nutrient overloads, and pesticide pollution are very common.

Use of reduced-volume irrigation systems, management of soils and crops to minimize water loss, selection and breeding of hardier animal breeds, and increased tolerance to salt and drought are all strategies to use water more effectively in sustainable agroecosystems.

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Possible solutions

Sustainable farming is vital because it offers an answer to the issues caused by the way most of our food is grown today. Today's industrial farming methods, many stemming from the 60s, are depleting our natural resources and therefore the overuse of pesticides and fertilizers, while leaving people with unequal access to food and nutrition round the world.

The use of sustainable farming practices enables humans to achieve their requirements without endangering the environment. This may be important not only for us and our continued enjoyment of nature and natural resources but also for the animals with which we share our space.

By moving toward more sustainable agriculture the health of both humans and animals are often improved. The term "sustainable farming" describes a general approach, and there's not an actual recipe for the way to control a sustainable farm. The farmers apply methods that be to them which reflect their values. In what follows, we wish to present to you, the principles of sustainable and smart agriculture.



Alternative agriculture, a subset of sustainable agriculture, consist of several different methods, including organic farming, regenerative agriculture, and permaculture. These farming techniques share the most goal of reducing and ultimately eliminating the utilization of pesticides and inorganic fertilizers. Like sustainable agriculture, these methods aim to be more environmentally responsible than industrial agriculture.

<https://pixabay.com/photos/netherlands-nederland-above-boven-2230828/>

Agroforestry is that the practice of integrating trees into fields used for crop production or livestock. In addition to having many levels, forests also contain a variety of species and store carbon. Agroforestry is the practice of planting crops by farmers in accordance with natural forest patterning.

The agroforestry provides many benefits including providing shade and wind protection and supporting wildlife. Farmers can even make certain of the ecosystem by better water management, thus minimizing the employment of fertilizers and pesticides so as that runoff from their farms doesn't contribute to pollution.

Rather than using sprinklers, as an example, farmers seeking to conserve water can install drip lines to irrigate their plants. Planting cover crops like rye, clover, oats, and mustard protects the soil from erosion. They'll also help with pest management and soil fertility.

After presenting them above, the subsequent question returns: how can we help? In our opinion, one among the foremost important things we will do to support sustainable agriculture is to buy local.

Farms that are locally owned tend to use more sustainable methods. Rather than purchasing produce from a series grocery, visit a farmer's market or stand. By choosing to buy locally, you're helping to extend demand for sustainably grown products and supporting the farmers that use these methods so they will continue production.



Sustainable agriculture is that the thanks to maintain a parity between the increasing pressure of food demand and food production within the future. As increment, change in income demographics, and food preference changes, there are changes within the demand of food of the long run population.



Further, changes in climate and increasing concern regarding the depletion of non-renewable sources of energy has forced policymakers and scientists to device otherwise to sustain the available resources moreover as continue meeting the increased demand of food.

Sustainable agriculture is that the method through which these problems may be overlooked, bringing forth a brand new integrated kind of agriculture that appears at food production. Natural resources and the environment are frequently under severe strain due to agriculture. The goals of sustainable agriculture are to improve soil fertility, safeguard the environment, and increase the Earth's natural resource base.



<https://pixabay.com/photos/pfrunger-castle-hamlets-of-ried-3621121/>

A wide range of agricultural techniques, including conventional and organic ones, are typically included in sustainable agriculture. The long-term effects of a regionally integrated system of plant and animal production techniques include sufficient human food, feed, fiber, and fuel production to meet the demands of a rapidly expanding population, environmental protection and increasing the availability of natural resources, maintain agriculture systems' ability to make a profit.

Conclusions

The fundamental aims of sustainable agriculture are social and economic fairness, economic viability, and environmental health. In order to be sustainable, we must be able to fulfill our needs without risking the ability of future generations to meet their own needs.

Stewardship of both natural and human resources is therefore crucial. Understanding sustainability requires a systems approach. The system is envisioned in the broadest sense possible, encompassing not just the individual farm but also the local ecosystem and the communities that are both locally and globally impacted by this farming system. A systems approach also calls for joint research and teaching initiatives.



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Researchers from a variety of fields must contribute to this, but so must farmers, farmworkers, consumers, policymakers, and others. It takes time to change agriculture to be more sustainable. The move to sustainable agriculture typically necessitates a series of modest, doable actions for farmers. How quickly or how far participants can progress in the transition depends on family economics and personal objectives.

It is crucial to understand that every minor choice counts and helps move the system as a whole along the “sustainable agricultural continuum.” Finally, it is crucial to emphasize that everyone involved in the system, including farmers, workers, legislators, academics, retailers, and customers, must work toward the objective of sustainable agriculture. Each group can grow the sustainable agricultural community by contributing in its own special way.



<https://pixabay.com/photos/sprout-gardening-seedling-nature-6731048/>



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